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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/366,963	08/04/1999	CHRIS HEEGARD		3713

7590 03/03/2004

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EXAMINER

ABRAHAM, ESAW T

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 03/03/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/366,963

Applicant(s)

HEEGARD ET AL.

Examiner

Esaw T Abraham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6, 8-12, 15-18, 20 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 9 and 18 is/are rejected.
- 7) ☒ Claim(s) 6, 10-12 and 15-17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to the applicant's argument

Response to remark page 6, the applicant argues that Paik uses trellis code modulation with a binary convolutional code of rate $\frac{1}{2}$ having generators and this particular rate $\frac{1}{2}$ code was likely not arbitrarily chosen by Paik. Unlike the assumptions of the applicant, the examiner believes that the particular rate $\frac{1}{2}$ code is chosen based on the or determined Paik's preference or convenience for encoding the first bit with a rate $\frac{1}{2}$ binary convolutional encoding algorithm to provide a 2 bit codeword that defines one of four subsets an N-bit QAM constellation pattern. Therefore, the applicants' argument although acknowledged, has not been found to be convincing.

DETAILED ACTION

1. Claims 1, 2-3, 6, 8-12, 15-18 and 20 are presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationship is: the "said scrambler" is unknown to the apparatus of claim 18.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the difference between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or non-obviousness.
3. Claims **1, 9 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over by Paik et al. (U.S. PN: 5,233,629).

Paik et al. disclosed an apparatus and method for encoding data for use in the digital communication systems (see col. 4, lines 48-50) comprising a binary convolutional encoder (see figure 2 element 48 and col. 4, lines 50-56) employs a rate 1/2, 64-state convolutional code, in which generators are 171 and 133 in octal. Paik et al. teach the invention as detailed but did not **explicitly** teach octal generator 175. **However**, designing convolutional encoders characterized by numbers (octal) referred to as generators for LSB, CSB and MSB is a matter of the designer's choice. **Therefore**, it would have been obvious to one ordinary skill in the art at the time the invention was made design various types of generators of octal generator. **This modification**

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would have been obvious because a person having ordinary skill in the art would have been motivated to increase the alternatives of encoding and flexibility of configuration that results in heightening the encoding efficiency.

As per claim 9, Paik et al. teach all subject matter claimed in claim 18 including Paik et al. teach two coded bits output from a convolutional encoder which are QPSK (in-phase (I) and quadrature (Q) channels) codeword and are selected a constellation subject (see col. 7, lines 12-16).

4. Claims 2, 3 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Paik et al. (U.S. PN: 5,233,629) in view of Oshima et al. (U.S. PN: 4,639,548).

As per claims 2 and 20, Pike et al. substantially teach all subject matter claimed in claim 1 and 18. Paik et al did not **explicitly** teach a method of scrambling a data. **However**, Oshima et al. in an analogous art teach a scrambler and a method for performing scrambling data (see figure 4, element 1a) and encoding a convolutional code (see fig. 4, element 33). **Therefore**, it would have been obvious to one ordinary skill in the art at the time the invention was made to incorporate Oshima's scrambler and methods of scrambling in the system of Paik et al. to perform an encoded form of a signal that is unintelligible. This **modification** would have been obvious because a person having ordinary skill in the art would have been motivated to scramble a data in order disarrange the elements of a transmission (a telephone or a TV signal) that results in making the signal unintelligible to interception.

As per claim 3, Paik et al. in view of Oshima et al. teach all subject matter claimed in claims 1 and 2 including Paik et al. teach two coded bits output from a convolutional encoder

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which are QPSK (in-phase (I) and quadrature (Q) channels) codeword and are selected a constellation subject (see col. 7, lines 12-16).

Allowable subject matter

5. Claims 6, 10-12 and 15-17, are objected to as being dependent upon a rejected base claim but would be allowable if rewritten independent from including all of the limitation of the base claim and any intervening claims.

The claimed apparatus wherein said codewords are mapped to a constellation to a pseudo-random scramble sequence comprising bits having one of first and second binary values; in the event a bit of the scramble sequence has first binary value, maintaining constellation in a current relationship with respect to constellation axes and in the event a bit of the scramble sequence has said second binary value rotating said constellation (**as in claim 10**) which the prior art do not teach or render obvious.

Claims 11 and 12, which are directly, or indirectly dependents of claim 10 are also objected.

The claimed scrambling step comprising the steps of mapping said codewords to a constellation according to a pseudo-random scramble sequence comprising bits having one of first and second binary values; in the event a bit of the scramble sequence has first binary value, maintaining constellation in a current relationship with respect to constellation axes and in the event a bit of the scramble sequence has said second binary value rotating said constellation (**as in claim 15**) which the prior art do not teach or render obvious.

Claims 6, 16 and 17, which are directly, or indirectly dependents of claim 10 are also objected.

Examiner's statement for reason for allowance

The following is an examiner's statement for allowance:

6. Claim 21 have been allowed.

As per claim 21, the prior arts (Paik et al. and Oshima et al.) of record teach all the subject matter claimed in claims 1 and 18. However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious a method of conventionally encoding digital data for transmission over a communication channel comprising encoding data using a binary convolutional code to provide codeword, mapping said codewords to a constellation according to a pseudo-random scramble sequence comprising bits having one of first and second binary values; in the event a bit of the scramble sequence has first binary value, maintaining constellation in a current relationship with respect to constellation axes and in the event a bit of the scramble sequence has said second binary value rotating said constellation. Consequently, claim 21 is allowed over the prior art.

Conclusion

7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (703) 305-7743. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone numbers for the organization

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where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for after final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Esaw Abraham

Esaw Abraham

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Albert J. Zorby
SUPERVISORY PATENT EXAMINER
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